African Invertebrates Vol. 48 (2) Pages 253–257 Pietermaritzburg December, 2007

SHORT COMMUNICATIONS

The distribution, ecology and phenology of the South African Natalimyzidae (Diptera: Schizophora: Sciomyzoidea)

David A. Barraclough

School of Biological & Conservation Sciences, Howard College, University of
KwaZulu-Natal, Durban, 4041 South Africa, and Natal Museum, P. Bag 9070,
Pietermaritzburg, 3200 South Africa; barracloughd@ukzn.ac.za

ABSTRACT

A listing of all Natalimyzidae material deposited at the Natal Museum is provided. Data for the two species groups are presented separately. The species group with a depressed head and eye in profile is encountered relatively infrequently, and is recorded only from Mpumalanga, KwaZulu-Natal, and Eastern Cape. A distribution map based on the Natal Museum material shows that the family is widely distributed in the eastern summer rainfall region; it is suggested that natalimyzids may prove to be absent from the arid north-west of the country (Northern Cape). Natalimyzidae have been collected from a variety of habitats, ranging from coastal dune vegetation to grassland at about 2800 m in the KwaZulu-Natal Drakensberg; although grassland is the predominant habitat, some species occur in forested areas. Grassland species sometimes occur sympatrically, and at a particular habitat there may be a succession of species through the seasons. Highest abundance during the dry winter months in the eastern provinces is confirmed; only 13% of the 420 specimens studied was collected during the five-month summer rainfall period from September to February.

KEY WORDS: Afrotropical, South Africa, Diptera, Natalimyzidae, true flies, distribution, ecology, phenology, Natal Museum.

INTRODUCTION

The family Natalimyzidae was described by Barraclough and McAlpine (2006) to accommodate a single new genus of African grassland flies (*Natalimyza*), which was referred to the Sciomyzoidea. All known species are small (2.5–4.5 mm), yellow to brown flies, which are nearly always collected by sweep-netting. The Natalimyzidae is the first widespread new family of Diptera described entirely from new African taxa. It is widespread in Africa, but is thought to be absent from Madagascar (Barraclough & McAlpine 2006). The description of the new family was based on a substantial holding of more than 400 specimens deposited in the Natal Museum. A few specimens from the Eastern Highlands of Zimbabwe excepted, the Natal Museum's collection comprises South African material collected over almost 50 years, and is a significant reflection of collecting effort by South African dipterists during this period.

The intent of this short paper is to present significant data that were not included or fully discussed elsewhere, and to clarify and add to a number of issues discussed in the original publication (Barraclough & McAlpine 2006). It is hoped that the listing of material (below) will also facilitate further studies, and encourage fieldwork in areas where sampling has been inadequate or has not taken place.

MATERIAL AND METHODS

The paper is based entirely on specimens deposited in the Natal Museum. The following label data were included in the listing of material: locality (with spelling corrections), co-ordinates (when cited), altitude (when cited), collection dates, ecological/biological information. Numbers in parentheses denote numbers of specimens. My remarks and clarifications are given in square brackets. Material is listed alphabetically by locality name; provincial listings are from north to south. Additional details, including the names of collectors, were not included. Badly damaged specimens, including those lacking heads, were not included in the listing or treated in the discussions. Some very closely approximated localities in KwaZulu-Natal were omitted from the distribution map. In terms of the brief phenological survey (based on label data), specimens with collection date ranges spanning two or more months were not included.

SPECIES GROUP LISTINGS

According to Barraclough and McAlpine (2006), there are two species groupings in *Natalimyza*. The first grouping includes variably coloured species with the head and eye more or less rounded in profile, the proboscis relatively well developed, and the bristles on the dorsal part of the head elongate and well developed. The second grouping includes largely pallid species, with the head and eye noticeably depressed in profile, the proboscis reduced in size, and the bristles on the dorsal part of the head reduced in length and strength. Further examination of material confirms that there are a number of intermediate forms, and based on external characters, I believe that generic distinction is not warranted.

To assist future workers, the material listed below is segregated into the two species groups. It is immediately evident that species with a depressed head profile are relatively infrequently encountered, and are not as widespread as members of the other species group, being absent from the Western Cape and Limpopo. Further collecting is needed to confirm this.

Species group 1 (head and eye rounded in profile)

Limpopo: 1♀ Woodbush, iv.1915.

Mpumalanga: 1♀ 10–15 mls SE Lydenburg, 7.v.1951.

KwaZulu-Natal: 8♂ 8♀ [5 km SE] Ashburton, 29°40'S:30°28'E, viii.1980, grassland; 6♂ 12♀ 1? Cathedral Peak Forestry Reserve, fire lookout, 7500–7700 ft, iii.1959, grassland on steep slopes; 1♂ 1♀ same data, except Indumeni River Headwaters, 8500–9200 ft; 1♂ 1♀ Cathedral Peak area, 28–31.v.1981, 2.v.1984, 1800 m, grassland; 1♂ 1♀ same data, except 2.vi.1984; 2♂ 2♀ Eshowe, Dlinza Forest Nat. Res., 450 m, 27.vii.1980, indigenous forest; 1♂ 2♀ Geekie's Farm, Karkloof, nr Mt Alida, 14.iii.1962; 4♂ 3♀ Giant's Castle Game Reserve, 1900 m, 20–21.ii.1982, grass[land] swale/along river; 3♀ same data, except 8.iv.1981; 1♂ same data, except 6.iv.1984; 1♂ 3♀ Giant's Castle Game Reserve, Injasuti, 29°09'S:29°25'E, 7–8.vi.1980, along river tributary; 1♂ Karkloof, 4.x.1960; 2♀ 1? Karkloof Falls, 15 km NE Howick, 3.vi.1979; 2♂ 11♀ Karkloof Range, nr Mt Alida, 17.vi.1974, temperate forest, nr pond; 1♀ La Mercy, Umdloti, 24.vii.1963, coastal bush, seashore; 1♂ 1♀ Lion's Bush, Nottingham Rd, 27.iv.1955, indigenous forest; 2♀ 1.5 km E Mtunzini, Umlalazi Nat. Res., 2–5.vii.1979, coastal dune vegetation; 1♀ same data, except i.1979, indigenous forest; 1♂ 6♀ 3? same data as previous, except 2nd dune stack/dunes; 1♂ 2♀ Ngome Forest between Vryheid and Nongoma, 11–12.iv.1980; 2♀ 1♂ Ngoye Forest, 11–12.iv.1960; 1♀ Pietermaritzburg, Town Bush, ii.1976; 1♂ 17♀ same data, except iv.1976 (2), v.1976 (3), vi.1976 (6), vii.1976 (5), ix.1976 (1), xi.1976 (1); 2♂ 5♀ same data, except vi.1977; 13♂ 1♀ same data, except 950 m, 19.viii.1978; 6♂ 6♀ same data, except 9.vi.1979; 1♂ same data, except 29.vi.1980, 950 m, grassland; 4♂ 2♀ same data, except 7.vi.1981; 2♂ same data, except 8.viii.1981; 2♂ same data, except 17.v.1982; 3♂ same data, except 950 m, 1.viii.1984; 1♀ same data, except 12.v.1977, blue gum plantation litter; 1♂ 2♀ nr Rietvlei, Karkloof, 31.v.1977; 1♂ 2♀ 15 km SE Rorke's Drift, 28°30'S:30°30'E, 29–30.v.1982; 2♂ same data, except 30.v.1982; 4♂ 8♀ Royal Natal National Park, 1530 m, 11–16.ix.1963, montane forest; 1♀ same data, except Tendele camp, 28°40'S:28°55'E, 16–18.iii.1990, lights; 2♂ 1♀ Ubombo, Lake Sibaya, 27°20'S:32°45'E, 8–18.vii.1982; 1♂ 3♀ same data, except 30.v–4.vii.1982, forest, swamp; 1♂ 1♀ Umgeni Valley Ranch, 1 km N Howick, 7.iv.1980, hillside; 2♀ Umkomaas, 11.x.1983; 2♀ N Umkomaas, 22.viii.1981, *ex* sand dunes/on window; 1♂ 1♀ same data,

except 21.vi.1980; 10♂ 38♀ Van Reenen, 28°22'S:29°23'E, 1940 m, 21–25.iii.1984; 1♂ Van Reenen, 21.iv.1984; 2♂ 4♀ Van Reenen's Pass, Windy Corner, 1680 m, 25.iii.1984; 2♂ 2♀ 1? same data, except 21.iv.1984; 3♂ 1♀ 3 km SE Van Reenen, Windy Corner, 1600 m, 25.iv.1984.
Eastern Cape: 6♂ 9♀ Coffee Bay, Transkei, 31°59'S:29°08'E, 30 m, 17–18.vii.1982; 1? East London, vii.1914; 1♂ 1♀ Faraway, 5 km SW Grahamstown, 10.i.1984; 1♂ 1♀ Grahamstown, ii.1979, knock-down from *Erythrina caffra*; 1♂ Grahamstown, 1.ii.1979, from *Quercus* sp.; 1♀ Jeffrey's Bay, 2.xi.1978, dune vegetation; 1♂ 2♀ Katberg, 4000 ft, x.1932 (2), 1–13.xi.1932 (1); 7♂ 2♀ Transkei, Hluleka Nat. Res., 21–25.vii.1981; 3♂ 1♀ Transkei, The Haven, 27–28.vi.1979, indigenous grassland; 1♂ Van Staden's Pass, v.1959.
Western Cape: 1♂ 1? Mossel Bay, vi–vii.1930; 2♂ 1♀ 1? Table Mountain slopes, above cable house, Cape Town, 24.ix.1959.

Species group 2 (head and eye depressed in profile)

Mpumalanga: 1♀ Mariepskop, 1500 m, 8.iv.1964.
KwaZulu-Natal: 2♀ 1? 5 km SE Ashburton, 29°40'S:30°28'E, viii.1980, grassland; 3♀ Cathedral Peak area, 1800 m, 11–12.x.1986, grassland; 9♂ 12♀ same data, except 2.vi.1984; 1♀ Cathedral Peak area, Ukhahlamba Research Station, above 1700 m, 18–31.v.1983; 1♂ Deepdale, Umkomaas Valley, v.1959; 1♀ Eshowe District, Ntumeni Forest, 6.x.1983; 1♂ 6♀ Giant's Castle Game Reserve, 28.vi.1981, grassland swale; 1♀ 1.5 km E. Mtunzini, Umlalazi Nat. Res., 3.vii.1979, coastal indigenous forest; 1♀ same data, except 2–5.vii.1979, coastal dune vegetation; 1♂ 2♀ Pietermaritzburg, Town Bush, iv.1976 (1), v.1976 (2); 1♀ Uvongo, 30°50'S: 30°25'E, 11.x.1983; 1♂ 1♀ University of Natal, Ukulinga Research Station, 10 km SE Pietermaritzburg, 14.v.1984, grassland; 22♂ 6♀ same data, except 1.viii.1984, grassland; 2♂ 7♀ same data, except, 13.v.1985; 1♂ 1♀ same data, except 29.v.1985; 1♂ same data, except 20–26.v.1986, impoundment; 1♂ same data, except 27.v–2.vi.1986.
Eastern Cape: 1♀ Jeffrey's Bay, 2.xi.1978, dune vegetation; 11♂ 12♀ Transkei, The Haven, 27–28.vi.1979, indigenous grassland.

DISTRIBUTION

A distribution map of the South African Natalimyzidae (Fig. 1) reveals that the family is distributed widely throughout the eastern provinces, which are largely in the summer-rainfall region. Only one record (Table Mountain, Cape Town) is from the winter-rainfall

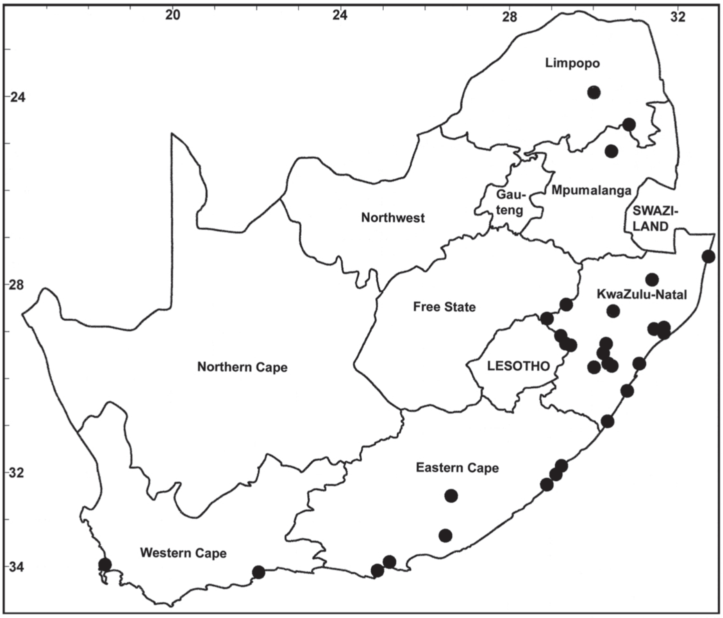

Fig. 1. Map showing the distribution of Natalimyzidae in South Africa.

region. Much more collecting in the Western Cape, Mpumalanga, and Limpopo is required to reveal distributional trends there. It is almost certain that the family occurs in Gauteng, North West Province, and the Free State, and its absence from these provinces is almost certainly a reflection of limited regional collecting effort. The Northern Cape in the arid north-west of the country is dominated by Nama and Succulent Karoo vegetation with little grass cover, and the Natalimyzidae may not be present there. There are currently no records from the Northern Cape.

In the Eastern Cape and KwaZulu-Natal, where most material has been collected, it is evident that Natalimyzidae are distributed through a variety of habitats at various altitudes. In KwaZulu-Natal the family occurs along the coast, in the midlands, as well as in the Drakensberg at altitudes reaching 2800 m.

ECOLOGY

Although Natalimyzidae are considered, in the main, to be grassland flies, there are clear exceptions, and special mention needs to be made of such instances. Through much of its range in South Africa, *Natalimyza* sometimes occurs in forested areas, for example in the Magoebaskloof of the Limpopo Province, and in the Dlinza/Ntumeni Forests near Eshowe in KwaZulu-Natal. During May 2007, a significant amount of material was collected in the Amatola Forests (Eastern Cape) in forest glades and along paths, as well as in understory forest with very little grass cover (Kirk-Spriggs pers. comm.). In addition, *Natalimyza* has also been collected in coastal dune vegetation with little grass cover at several localities in KwaZulu-Natal. At Grahamstown, material has apparently been collected from *Erythrina caffra* Thunb. and a species of *Quercus* (exotic), although a definite association with these trees is not certain.

Additional detailed information on the association of *Natalimyza* with grassland has become available as a result of collecting effort in the Grahamstown area by Mr A. Kirk-Spriggs (Albany Museum) during the summer of 2007. Abundant material of at least two species (belonging to the two species groups) was swept from grasses in the hills around Grahamstown in poorly-drained, degraded fynbos. The swept area was dominated by the common grass *Setaria sphacelata* (Schumach.) Moss, interspersed with *Eragrostis capensis* (Thunb.) Trin., *E. curvula* (Schrad.) Nees, and *Melinis repens* (Willd.) Zizka (all Poaceae) (Dold pers. comm.).

A detailed perusal of all *Natalimyza* material confirms that species may occur sympatrically in grassland, and that there seems to be a succession of different species at a particular locality through the different seasons. Further taxonomic studies and fieldwork are required to confirm this. Natalimyzidae may prove to be a useful model to assist with the understanding of speciation and community dynamics in South African grasslands.

PHENOLOGY

In the publication by Barraclough and McAlpine (2006), it was suggested that *Natalimyza* is most often collected during the dry winter months in the summer-rainfall region. A detailed survey of the collection dates of all available material reveals different levels of abundance through the months of the year, as shown in Table 1.

Most specimens were collected in the months of March, June, and August, and the fewest (about 13% of the total) during the five-month period from September to February,

TABLE 1

Levels of abundance of *Natalimyza* based on collection dates.

Jan	**Feb**	**Mar**	**Apr**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
13	11	79	29	36	111	40	70	17	10	4	0
24 Late summer		108 Autumn		147 Early to mid-winter		110 Late winter		27 Spring		4 Early summer	

which largely coincides with the rainy season in the eastern provinces. The peak in numbers in March may be a collecting artefact, as this is the month most favoured by dipterists for the collection of Diptera, particularly in the KwaZulu-Natal Drakensberg. It is, however, also a time when many grasses are at the climax of their growth. When numbers for the two-month periods are added together, a noticeable trend is revealed. Population numbers are at their lowest during spring and throughout summer, when most precipitation is recorded in the eastern provinces. Population numbers increase dramatically during autumn, when the rainy season is tapering off, and are at their highest during winter when there is usually minimal precipitation.

Although this confirms the premise that Natalimyzidae are most abundant during the dry winter months, further collecting is required to confirm this.

ACKNOWLEDGEMENTS

Mr A. Kirk-Spriggs (Department of Entomology & Arachnology, Albany Museum, Grahamstown) kindly provided information about natalimyzid material collected by him in the Eastern Cape. Mr T. Dold (Selmar Schonland Herbarium, Botany Department, Rhodes University, Grahamstown) is thanked for the identification of grasses. The School of Biological & Conservation Sciences, Howard College, Durban, and Prof. R. Slotow in particular, are thanked for resources provided.

REFERENCE

Barraclough, D.A. & McAlpine, D.K. 2006. Natalimyzidae, a new African family of acalyptrate flies (Diptera: Schizophora: Sciomyzoidea). *African Invertebrates* **47**: 117–134.